



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/188,241 | 11/09/1998 | WENZHE LUO | LUO-4 | 4099 |

7590 06/04/2003

FARKAS AND MANELLI
SEVENTH FLOOR
2000 M STREET N W
WASHINGTON, DC 200363307

EXAMINER

ENGLUND, TERRY LEE

ART UNIT

PAPER NUMBER

2816

DATE MAILED: 06/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/188,241

Applicant(s)

LUO, WENZHE

Examiner

Terry L Englund

Art Unit

2816

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 March 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 11-14, 18, 19, 21 and 22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-14, 18-19, and 21-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

The amendment submitted on Mar 27, 2003 was reviewed and considered with the following results:

The amended change to page 7 overcame the objections to its lines 17-22 described in the previous Office Action. Therefore, those objections have been withdrawn.

Almost all of the rejections of claims 1-14, 18, 19, 21, and 22 under 35 U.S.C. 112, second paragraph were overcome by the amended claims. However, claims 21 and 22 still have their "equalize a current level" problem. These rejections are described later under the appropriate section. Also, although all the other 35 U.S.C. 112 rejections from the previous Office Action have been withdrawn, the amended claims created new objections and rejections that are described later under the appropriate section.

The cancellation of claim 10 rendered its rejections moot.

The amended claims and/or related comments, overcame the prior art rejections of: 1) claims 1-5, 8-9, 12, 13, 14, 18, 19, 21, and 22 under 35 U.S.C. 103(a) with respect to Ravon; 2) claims 6, 7, and 11 under 35 U.S.C. 103(a) with respect to Ravon and the applicant's Prior Art Fig. 3; and 3) claims 1-9, 11, and 12-14 under 35 U.S.C. 103(a) with respect to Harston. Neither the reference of Ravon nor Harston shows the (controlled) current flow to an amplifier within the pull-down mirror path as now recited (and/or understood) within claims 1 and 22. Also, the operation of the switches in Ravon's reference, is not clearly identified as being complementary as now recited within claims 18 and 22. Therefore, all of the above prior art rejections have been withdrawn.

Art Unit: 2816

However, the previous Office Action's rejections of claims 18-19 under 35 U.S.C. 103(a), with respect to Harston, have been modified to account for the amended claim changes. Also, since claim 22 had sections related to "operating complementary" and "substantially continuously" amended (e.g. added or deleted), it is now believed Harston also reads on the presently understood limitations recited within claim 22. These prior art rejections are described later under the appropriate section.

Claim Objections

Claims 8, 13, and 21-22 are objected to because of the following informalities: Since claim 1 now recites "an amplifier", it is suggested "said pull-down mirror path comprises:" on line 2 of both of claims 8 and 13 be changed to --said amplifier is--. These changes will relate the amplifier in each of claims 8 and 13 to the amplifier already in claim 1. Otherwise, it is possible the claims could be implying the circuit comprises more than one amplifier. It is suggested "switch to" on line 6 and 5 of claims 21 and 22, respectively be changed to --switch in-- to minimize possible confusion. For example, the applicant's Fig. 5 shows switch MT as being part of pull-down mirror path 450. Without the switch, the pull-down mirror path would not be considered parallel with the transistor switch. Since claim 21 had already recited the current, it is suggested --said-- be added prior to "current" on line 12 of the same claim. Dependent claims carry over any objection from claims upon which they depend. Appropriate corrections are required.

Claim Rejections under 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 2816

Claims 1-9, 11-14, 18-19, and 21-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. The use of “ensure a constant current path” on line 7 of claim 1 is misleading. If the current is switched between the transistor switch and pull-down mirror paths, why would the path be considered constant? It is suggested “path” be changed to either --flow-- or --flows-- since the switching between the two paths will continuously allow the current from the current source to flow into the path(s). Similarly, “switching of current” on line can be confusing. For example, how is this related to “controlling current flow to said amplifier” cited on line 6? Therefore, it is suggested “of current” on line 11 be changed to --of said current between said two paths-- to help clarify the claimed limitation. Claim 18, lines 4-5 have the same type of “ensure a constant current path” problem as claim 1 described above. It is not clear what the applicant means by “amplifying current directed to said pull-down mirror path” recited on line 8 of claim 18. For example, where does disclosure describe current amplification? Also, from the applicant’s own Fig. 5, when switch MS/430 is off and switch MT is on, current IA will be directed to flow into pull-down mirror path 450. However, where and how is this current to the pull-down mirror path amplified? For example, is the current amplification done by the current source transistor MC? Also, it is not clearly understood how “switching of current flow” in claim 18, line 13 relates to the turning of the switches on and off, and the “amplifying current” recited within claim 18. Therefore, corrections and/or clarifications are requested. Lines 9-10 of both claims 21 and 22 have the same “ensure a constant current path” problem as claim 1 described above. For example, if the current is switched from one path to another, how can the “current path” be considered constant? Claims 21 (line 10) and 22 (lines 10-11) still have the

Art Unit: 2816

“equalize a current level produced by said current source” phrase. As presently understood, it is believed the current source provides a constant current. Therefore, how is the current from the current source equalized? Since “switching of current” on line 14 of claim 21, and on line 15 of claim 22, could possibly be confusing with respect to the opening and closing of the switches recited within each of the respective claims, and the “current is switched” on line 12 of claim 21, it is suggested the “switching of current” phrase be changed to indicate --said switching of said current between said pull-down mirror path and said transistor switch--.

Dependent claims carry over any rejection from claim(s) upon which they depend.

Claim Rejections under 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 18, 19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harston, a reference cited in the previous Office Actions. Although the reference does not clearly show or disclose reduction of charge injection, it would be obvious to one of ordinary skill in the art that the Fig. 3 circuit of Harston would provide a method for reducing charge injection from a current source through a current switch into a load, wherein pull-down mirror path/switch MP3 is in parallel with current switch MP2. [MP3 is considered a pull-down mirror path since it mirrors the operation of current switch MP2 and allows the current from current source MP1 to flow down to ground when switch MP2 is not conducting. See column 2, lines 64-68. MP3 is considered in parallel with MP2 because they both share a common connection to

Art Unit: 2816

current source MP1, and both are coupled to ground (e.g. MP3 directly, and MP2 through the load).] Since the switches operate in a complementary manner (i.e. they are the same type of transistors that receive complementary signals DATA and DATAB), switch MP3 will be off when current switch MP2 is on, and vice versa. Therefore, a current will continuously flow through current source MP1. With a common connection between MP3 and MP2, MP3 and MP2 can be considered one type of a constant current path since the current flowing from current source MP1 must flow into either MP2 or MP3. Since the constant current flow will not allow any charge injection to build up within MP1, the charge injection flowing to load $37.5\Omega, 10\text{pF}$ will obviously be reduced when the current is switched from the path comprising the pull-down mirror path/switch MP3 to the current switch MP2 path. By controlling voltage BIAS to the gate of current source MP1, the current flowing through it can be considered amplified (e.g. a higher BIAS will decrease the amount of current flow, wherein a lower BIAS will increase the amount of current MP1 will allow to flow through it). Therefore, when MP3 is conducting, the current flowing from current source MP1 is directed to pull-down mirror path MP3, and this current is deemed an amplified current, thus rendering claim 18 obvious. Current source MP1 is a MOS transistor, and claim 19 is also rendered obvious. Interpreting Fig. 3 in another manner, a high DATAB signal provides the means to open transistor switch MP2 that connects current source MP1 to load $37.5\Omega, 10\text{pF}$ (e.g. it is understood that when MP2 is closed, the current source is connected to the load, and when MP2 is opened, the current source and load are disconnected from each other); a low DATA signal provides a means for closing switch MP3 in a pull-down mirror path MP3 that is parallel to transistor switch MP2. Since signals DATA and DATAB are complementary, the opening and closing of the switches are considered simultaneous. With one

Art Unit: 2816

current path always allowing current flowing through current source MP1, no charge injection is built up within current source MP1, and charge injection from the current source to the load is reduced when current is switched from the MP3 path over to the MP2 path. Since the current flow from MP1 flows to a common connection between MP2 and MP3, one of ordinary skill in the art understand that the current flowing through MP2 (when closed) would be equal to the current that flows through MP3 (when it is closed). The operation of the switches merely diverts the current source's current flow from one current path to another. Therefore, whenever MP2 is conducting, the load will receive the reduced charge injection current from current source MP1, and claim 22 is rendered obvious.

Allowable Subject Matter

Although no claim is allowable as presently written, claims 1-9, 11-14, and 21 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims, where applicable. There is presently no strong motivation to modify or combine any prior art reference to ensure the pull-down mirror path includes a switch controlling current flow to an amplifier as recited within independent claim 1, upon which claims 2-9 and 11-14 depend. For similar reasons, it is understood from claim 21, and the applicant's disclosure and figures, that the amplifier within the pull-down mirror path receives the current flowing from the current source when the pull-down mirror path switch is closed.

Claims 10, 15-17, and 20 have been cancelled.

Response to Arguments/Comments

Although the examiner agrees that a consensus to amendments was reached during the interview on Mar 12, 2003, the amended claims must clearly convey the intended limitations recited. For example, it is understood that a constant current flows from the current source into one of two selected current paths. However, a “constant current path” does not necessarily mean the same as a “constant current flow”, and this can cause confusion. It was also pointed out during the interview that one type of amended change would overcome rejections related to one of the prior art references (e.g. Harston), but would not necessarily overcome the rejections with respect to the other reference (e.g. Ravon) without other additional changes. Perhaps the discussed consensus was misinterpreted by one, or both, of the parties involved in the interview.

After reconsidering the amended claims, and the prior art references, the objections and rejections described above are deemed proper with respect to how the claimed limitations and prior art references can now be interpreted.

The applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). The applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

Art Unit: 2816

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication, or previous communications, from the examiner should be directed to Terry L. Englund whose telephone number is (703) 308-4817.

The examiner can normally be reached Monday-Friday from 7 AM to 3 PM.

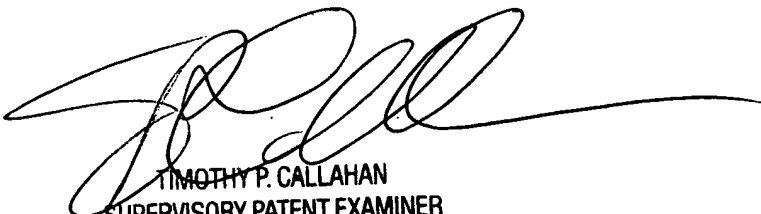
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Callahan, can be reached on (703) 308-4876. The fax number for TC 2800 is (703) 872-9318 for communications before a final action has been mailed, and (703) 872-9319 for communications after a final action.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

TLE

Terry L. Englund

2 June 2003


TIMOTHY P. CALLAHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800